combining substances. Page 114 of the same book (copy enclosed) sets forth a sample calculation. Applicants respectfully submit that one of skill in the art would have absolutely no trouble in determining exactly what is being claimed. Reconsideration of the rejection is requested.

Claims 1 through 8 were rejected under 35 U.S.C. 102 and 103 as being unpatentable over the Volkert reference (U.S. patent 5,096,933) or the Volkert et al references (U.S. patents 5,205,956 and 5,300,534). Applicants submit that the references cited do not disclose or fairly suggest the claimed invention.

The Volkert et al references (Applicants note that the '534 patent is a divisional of the '956 patent) require the presence of a vinylfluoroalkane as the blowing agent in the preparation of a foam. Applicants have presented a claim which would exclude the use of such a blowing agent. Clearly, the references do not disclose or suggest the claimed invention.

The Volkert reference is directed to the production of rigid polyurethane foams. The reference is silent as to the stoichiometry of the foam formulations described therein. However, the index used in Examples 1 through 5 of the reference is about 110 (this number can be readily calculated from the amounts of materials used). In the presently claimed invention an index of from 200 to 600 is required. Furthermore, the amounts of components 2), 4) and 5) required by the presently claimed invention are not suggested by the reference. It was surprising that the claimed formulation yielded isocyanurate foams which showed better dimensional stability and exhibited less shrinkage than isocyanurate foams not using the claimed formulation. In this regard, the Examiner's attention is respectfully directed to the results reported in Tables 1 and 2.

Reconsideration of the rejection is requested.

In view of the amendments and remarks presented herein, it is submitted that this application is in condition for allowance and such action is respectfully requested.

Respectfully submitted,

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URETHANE INDUSTRY TERMS

Prepared for The Martin Sweets Company, Inc.
by S. Alan Stewart

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ILD value—a shortened form of Indentation Load Deflection value, formerly known as RMA value. A series of readings would be used to make an ILD curve, a single specified reading such as the 25% ILD value would be used for direct comparisons. The Test Method is listed in Appendix II and is described in ASTM D 1564-63T.

ILD (65/25) Index—a ratio of the 65% compression value divided by the 25% value. This ratio or index indicates, to some extent, a more or less linear relationship between readings taken to form a resilience (ILD) curve. Index readings above 2.00 are usually considered good for urethane foam; while index readings below 1.75 are considered poor, and the foam can be described as "boardy"*.

impeller—a term used to describe the power driven mixing blade or rotor that is used to mix urethane components in a mixing head.

impeller housing—the shell surrounding the impeller and forming the outer limits of what is commonly called the mixing chamber. This is often readily removable for cleaning purposes. It may be smooth, grooved, or baffled.

indentation load deflection—See ILD Value.

Index—a measure of the stoichiometric * balance or the relationship between the equivalent weights* of the combining substances. In the case of urethane foam, this is the relationship between the equivalent weights of the isocyanate materials on the one side and the water and polyol equivalent weights on the other side. An Index of 100 indicates that both equivalents are equal or "balanced". An Index of 95 indicates that there is a 5% shortage of isocyanate while an Index of 105 indicates a 5% surplus of isocyanate. A slight theoretical excess of isocyanate, usually 3-5%, is common practice,

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particularly with flexible foams. Other levels may be specified with special formulations.

infinite flow-rate control—the ability to control the rate of flow of one or more of the components to any amount desired. This is very ambiguous, since maximum and minimum limits must usually be specified to obtain the desired tolerances of accuracy. Some degree of infinite control can be achieved with pressure pot metering, pneumatic drive motors, hydraulic drive motors, variable pitch sheaves, variable contact cones, etc. With some of these a wider range of control is achieved by the sacrifice of stability at a specified setting.

inhibitor—a substance that slows down chemical reaction. Inhibitors are sometimes used in certain types of monomers and resins to prolong storage life.

initial spot—a spot of off-quality foam located at the point where the first amount of liquid mixture was deposited. This can be due to improper pressure balance, unbalanced discharge velocities, extreme differences in viscosity, oversized mixing chamber, etc.

initiation time—a synonym for cream time. In frothing it usually refers to the delay time between the initial expansion and the beginning of the secondary or final expansion.

injection molding—a molding procedure whereby a heat-softened plastic material is forced from a cylinder into a relatively cool cavity which gives the article the desired shape.

in-line cutters—cutting machines that have been installed directly in a continuous slab foam production line so that handling of the foam is minimized. Some manufacturers trim only the top, bottom, and side skins at this point; others go all the way and make all the cuts in-line.

in-line heat exchangers—heat exchangers that have been installed in the flow circuit so that the pump must be operating for the exchanger to be effective. This serves to differentiate between this type and the blanket type units that are wrapped around machine tanks.

N. Chemical formulation calculations. (Index)

Index = 100 × (Formula F-1)

$$\text{Index} = 100 \times \frac{\dfrac{\text{Weight of TDI (or Isocyanate)}}{\text{Equivalent weight of TDI}^{**}}}{\dfrac{\text{Polyol weight}}{\text{Equivalent weight of polyol}^{**}} + \dfrac{\text{Water weight}}{\text{Equivalent weight of water}^{**}}}$$

This formulation can also be used to solve for unknowns. For example:

Weight of TDI = (Formula F-2)

$$\text{Weight of TDI} = \frac{\text{Index} \times \left[\dfrac{\text{Polyol wt.}}{\text{Equivalent weight of polyol}} + \dfrac{\text{Water wt.}}{\text{Equivalent weight of water}}\right] \times \text{Equivalent weight of TDI}}{100}$$

Example—Solving for unknown TDI weight

Given:
- Index = 105
- Polyol weight = 100 units
- Polyol equivalent weight = 1080 (OH No. = 52)
- Water weight = 3.6 units
- Water equivalent weight = 9
- TDI equivalent weight = 87

**Equivalent weights:

1. TDI equivalent weight is constant and = 87
2. Water equivalent weight is constant and = 9
3. Polyol equivalent weight varies with the OH number.

$$\text{Polyol equivalent weight} = \frac{56.1 \times 1000}{\text{Polyol OH number} + \text{polyol acid number}}$$

From Formula F-2

$$\text{Weight of TDI} = \frac{105 \times \left(\dfrac{100}{1080} + \dfrac{3.6}{9}\right) \times 87}{100}$$

$$= \frac{105 \times (0.093 + 0.40) \times 87}{100}$$

$$= 45.1 \text{ units of TDI by weight}$$

O. Calculations

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Item No. 5
Section A)

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